Log No. 194

TAG Revision 8/13/21

STATE OF WASHINGTON

# STATE BUILDING CODE COUNCIL

Washington State Energy Code Development

## Standard Energy Code Proposal Form

Code being amended: ☒ Commercial Provisions ☐ Residential Provisions

Code Section # C403.3.2.4, 403.4.1.1

Brief Description:

PTHP units are required by C403.4.1.1 but C403.4.1.1 and it's exception for PTHP specify control of the electric resistance that no available PTHP unit satisfies with the exception of one manufacturer. Yet units are being installed. A number of package terminal heat pump units have heat pumps that switch off whenever the exterior temperature is below 40°F. In the R1 and R2 buildings in which this units are installed a vast majority of the heating load occurs at temperature below 40°F. The proposal attempts to address both issues by making the requirements in C403.3.2.4 require a heat pump with defrost and the ability to operation in heat pump mode whenever the air temperature is over 25°F and the unit is not in defrost.

Proposed code change text: (Copy the existing text from the Integrated Draft, linked above, and then use underline for new text and ~~strikeout~~ for text to be deleted.)

**C403.3.2.4 Packaged electric heating and cooling equipment.** Packaged ~~electric~~ equipment providing both electric heating and cooling with a total cooling capacity greater than 6,000 Btu/h shall be a heat pump ~~capable of and~~ configured to operate in heat pump mode whenever the outdoor air temperature is above 25°F and the unit is not in defrost. The unit shall have ~~.~~ reverse-cycle demand defrost.

**Exception:** Unstaffed equipment shelters or cabinets used solely for personal wireless service facilities.

**C403.4.1.1 Heat pump supplementary heat.** Unitary air cooled heat pumps shall include microprocessor controls that minimize supplemental heat usage during start-up, set-up, and defrost conditions. These controls shall anticipate need for heat and use compression heating as the first stage of heat. Controls shall indicate when supplemental heating is being used through visual means (e.g., LED indicators). Heat pumps equipped with supplementary heaters shall be installed with controls that prevent supplemental heater operation above 40°F (4.4°C).

**Exception:** Packaged terminal heat pumps (PTHPs) of less than 2 tons (24,000 Btu/hr) cooling capacity ~~provided with~~ that have ~~controls that prevent supplementary heater operation above 40°F~~ reverse-cycle demand defrost and are ~~capable of and~~ configured to operate in heat pump mode whenever the outdoor air temperatures are above 25°F and the unit is not in defrost~~.~~

Purpose of code change:

Many PTHP units lock out the heat pump below 40°F. Very few actually have defrost. This is a special concern since the buildings PTHP units are typically installed in tend to have a low balance point and only require heat at cooler temperatures. At the same time C403.4.1.1 effectively bans PTHP units as current written. This proposal creates language that allows PTHP which is a roll back in code but it has been reported that many units were being installed anyway. The hope is that this code requirement will not be ignored like the current ones impacting PTHP equipment.

One could specify a lower temperature (5F) which would yield an inverter driven heat pump that would operate similar to minisplit heat pump but only a manufacturer was identified that would operate at this lower temperature. The benefit would be not just the lower temperature but getting an inverter which would mean much higher capacity at low temperatures. There is really a decision to be made about how valuable this class of equipment is.

Your amendment must meet one of the following criteria. Select at least one:

- ☐ Addresses a critical life/safety need.
- ☐ The amendment clarifies the intent or application of the code.
- ☒ Addresses a specific state policy or statute. (Note that energy conservation is a state policy)
- ☐ Consistency with state or federal regulations.
- ☐ Addresses a unique character of the state.
- ☐ Corrects errors and omissions.

Check the building types that would be impacted by your code change:

- ☐ Single family/duplex/townhome
- ☐ Multi-family 1 – 3 stories
- ☒ Multi-family 4 + stories
- ☒ Commercial / Retail
- ☒ Institutional
- ☐ Industrial


| | | | |
|---|---|---|---|
| Your name | Mike Kennedy | Email address | mikekennedy@energysims.com |
| Your organization | Mike Kennedy, Inc | Phone number | 3603010098 |
| Other contact name | Click here to enter text. | | |


## Economic Impact Data Sheet

Briefly summarize your proposal's primary economic impacts and benefits to building owners, tenants and businesses.

**This proposal is allowing this previously non-code compliant equipment to be installed by requiring a certain base performance. It is adding to designer flexibility by allowing this class of equipment.**

Provide your best estimate of the construction cost (or cost savings) of your code change proposal? (See OFM Life Cycle Cost **Analysis tool** and **Instructions;** use these **Inputs**. **Webinars on the tool can be found Here and Here**)

$0/square foot (For residential projects, also provide $0/ dwelling unit)

Show calculations here, and list sources for costs/savings, or attach backup data pages

**None**

Provide your best estimate of the annual energy savings (or additional energy use) for your code change proposal?

**None**

Show calculations here, and list sources for energy savings estimates, or attach backup data pages

**None**

List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

No additional time.